

## **CHAPTER 14. EMPLOYMENT IMPACT ANALYSIS**

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## **CHAPTER 14. EMPLOYMENT IMPACT ANALYSIS**

### **14.1 INTRODUCTION**

The Department of Energy (DOE) intends the employment impact analysis to estimate national job creation or job elimination resulting from possible new standards, due to reallocation of the associated expenditures for purchasing and operating equipment. DOE will conduct this analysis as one of the analyses for the notice of proposed rulemaking (NOPR). DOE will estimate national impacts on major sectors of the U.S. economy, using publicly available data and incorporating different energy price scenarios that it will carry out as part of the analysis for the NOPR. DOE will make all methods and documentation available for review.

The imposition of standards can impact employment both directly and indirectly. Direct employment impacts are changes in the number of employees at the plants that produce the covered equipment, along with the affiliated distribution and service companies, resulting from the imposition of standards. DOE will evaluate direct employment impacts in its manufacturer impact analysis, as described in Chapter 12. Indirect employment impacts may result from expenditures shifting between goods (the substitution effect) and changes in income and overall expenditure levels (the income effect) that occur due to the imposition of standards.

DOE expects new equipment standards to decrease energy consumption, and therefore to reduce expenditures for energy. The savings in energy expenditures may be spent on new investment and other items. The standards may increase the purchase price of equipment, including the retail price plus sales tax, and increase installation costs.

Using an input-output model of the U.S. economy, this analysis seeks to estimate the year-to-year effect of these expenditure impacts on net economic output and employment. A simple model might involve reduced expenditures for energy and reallocation of that money toward other sectors in the economy. DOE intends the employment impact analysis to quantify the indirect employment impacts of these expenditure changes. It will evaluate direct employment impacts in the manufacturer impact analysis step of the process.

### **14.2 METHODOLOGY**

To investigate the combined direct and indirect employment impacts, DOE will use the Pacific Northwest National Laboratory (PNNL)'s 'Impact of Sector Energy Technologies' (ImSET) model.<sup>1</sup> PNNL developed ImSET, a spreadsheet model of the U.S. economy that focuses on 188 sectors most relevant to industrial, commercial, and residential building energy use, for DOE's Office of Energy Efficiency and Renewable Energy. ImSET is a special-purpose version of the U.S. Benchmark National Input-Output (I-O) model, which has been designed to estimate the national employment and income effects of energy saving technologies that are deployed by DOE's Office of Energy Efficiency and Renewable Energy. In comparison with the

previous versions of the model used in earlier rulemakings, this version allows for more complete and automated analysis of the essential features of energy efficiency investments in buildings, industry, transportation, and the electric power sectors.

The ImSET software includes a computer-based I-O model with structural coefficients to characterize economic flows among the 188 sectors. ImSET's national economic I-O structure is based on the 1997 Benchmark U.S. table, specially aggregated to 188 sectors.<sup>2</sup>

DOE intends to use the ImSet model to estimate changes in employment, industry output, and wage income in the overall U.S. economy resulting from changes in expenditures in the various sectors of the economy. For example, commercial clothes washer standards may reduce energy expenditures and increase equipment prices in the commercial sector. These expenditure changes are likely to reduce commercial and energy sector employment. At the same time, these equipment standards may increase commercial sector investment, and increase employment in other sectors of the economy. DOE designed the employment impact analysis to estimate the year-to-year net national employment effect of these different expenditure flows.

## REFERENCES

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- <sup>1</sup> Roop, J. M., M. J. Scott, and R. W. Schultz. *ImSET: Impact of Sector Energy Technologies*, 2005. Pacific Northwest National Laboratory, Richland, WA. PNNL- 15273.
- <sup>2</sup> Lawson, Ann M., Kurt S. Bersani, Mahnaz Fahim-Nader, and Jiemin Guo. “Benchmark Input-Output Accounts of the U. S. Economy, 1997,” *Survey of Current Business*, December 2002. pp. 19-117.